Newsletter of the North American Mycological Association

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Hebeloma crustaliniforme *shows a classic ring of fruitbodies.*

Fairy Rings: Love 'Em or Leave 'Em

by Martin Osis

What's up with all those mushrooms poking up through the lawn? A couple of days of rain and then it seems that overnight they're popping up here and there singly or in groups, in a variety of shapes, sizes, and colors.

Mushrooms are, of course, the fruiting bodies of fungal organisms that live in our grass or on a piece of buried wood debris year after year. When all the conditions are right, the fungus shoots out a fruiting body, usually after a good soaking rain. Fungi consist mostly of water, so they require a good amount of it to be able to produce the mushroom, which in turn produces spores to continue its life cycle.

Fungi are the great recyclers of the world, playing an essential role in returning nutrients for all types of life, both plant and animal. Different from plants (and more like us), they do not produce chlorophyll but usually rely on plants for their energy source. In this process they exude enzymes, breaking down dead plant material and releasing nutrients for use by both plants and animals.

One of the best recognized of these fungi is the "fairy ring mushroom." It must be noted that there are a lot of different fungi that grow in rings and all of these fungi growing in rings on your lawn are recycling dead grass. The fungal organism itself grows in the ground as a mass of tiny thread-like roots. Some have been known to be 800 years old. The ancients believed that at night, tiny fairies came out and danced around in a circle. When they needed a rest they would sit down on the mushrooms. In the forest, rings with different but larger mushrooms grew providing a rest stop for larger fairies who, being bolder, were not afraid of the forest.

The fairy rings are rated by some as choice edibles, so one of the most efficient ways of getting rid of them is to eat them! But make sure that what you have is a true "fairy ring mushroom" (for details, see below). The many "little brown mushrooms"—LBMs—that grow on lawns should be avoided. (Regretfully, not all these LBMs, which are notoriously difficult to identify, are little nor are they all brown.) Mushrooms picked for the table must *always* be positively identified; and when eating these positively identified mushrooms for the first time, try them in small amounts as there is always a possibility of an allergic reaction.

If you observe the fairy ring, you will notice greener and faster-growing grass on the outside of the

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Proposed Slate for NAMA Officers

Each of these members has indicated a willingness to continue to serve another term in his or her respective position: Ike Forester, President; Bob Fulgency, 1st Vice-President; Judith McCandless, Treasurer. Other nominations may be submitted by the general membership. The nominations must be received prior to the 2006 NAMA Annual Meeting in August for distribution to the Trustees. A nomination must include in writing (1) the nominee's consent to serve, and (2) a brief biographical description of the nominee's qualifications and experience.

Fairy Rings, continued from page 1

Several other species of mushrooms can grow in a ring, including Amanita muscaria.

ring. This is because nutrients are being released by the fungus. Often the grass dies in the center because the root work or mycelium of the fungus, which is slightly greasy, grows so densely that it chokes off the water supply to the grass. If you want your grass to look good, aerate the ring with a garden fork, breaking up the fungus to allow water penetration to the grass. An application of soapy water also helps break down the oily mycelium. This tactic, which allows both mushrooms and grass to thrive, works best when the ring is still young. With proper fertilization the rest of the grass looks like the greener grass growing on the edge of the ring, making the ring hardly noticeable. Healthy grass, delicious mushrooms, sometimes, you *can* have your cake and eat it too!

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Termites tend round fungus balls (orange) amid a pile of eggs (white). For the rest of the story, see "Fungus in the News," page 5, item 1.

Moving?

Please send your new address, ***two weeks*** before you move, to

Ann Bornstein
NAMA Membership Secretary
336 Lenox Avenue
Oakland, CA 94610-4675
<Membership@namyco.org>

Otherwise—you may not be getting your newsletter for a while. Each issue, several *Mycophiles* are returned as undeliverable because of no forwarding address on file. NAMA is charged ***seventy cents*** for each returned or forwarded newsletter.

NAMA is a 501(c)(3) charitable organization. Contributions to support the scientific and educational activities of the Association are always welcome and may be deductible as allowed by law. Gifts of any amount may be made for special occasions, such as birthdays, anniversaries, and for memorials.

Special categories include
Friend of NAMA: $500–900
Benefactor: $1000–4900
Patron: $5000 and up

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2006 Mycology and Lichenology Seminars at Humboldt Institute

Steuben, Maine

For more information, ontact the Humboldt Institute, P.O. Box 9, Steuben, ME 04680-0009; phone (207) 546-2821; fax (207) 546-3042; email <office@eaglehill.us> Online registration and information at www.eaglehill.us or see the March/April 2006 issue of THE MYCOPHILE. An overview of this year's seminars:

Lichens and Lichen Ecology
May 21–27
Dr. David Richardson
(david.richardson@SMU.CA)
Dr. Mark Seaward
(m.r.d.seaward@bradford.ac.uk)

Advanced Mycology: Field and Lab Studies
June 18–24
Dr. Donald H. Pfister
(dpfister@oeb.harvard.edu)

Lichens for Naturalists
July 2–8
Dr. Fred C. Olday
(folday@panax.com)

Crustose Lichens: Identification Using Morphology, Anatomy, and Simple Chemistry
July 16–22
Dr. Irwin M. Brodo
(ibrodo@mus-nature.ca)

Slime Molds: Taxonomy and Ecology of Myxomycetes
July 23–29
Dr. Steven L. Stephenson
(slsteph@uark.edu)

The Fruticose Lichen Genus Usnea in New England
September 3–9
Dr. Philippe Clerc
(philippe.clerc@cjb.ville-ge.ch)

Intermediate Mushrooms for Naturalists
September 10–16
Dr. Rosalind Lowen
(Roz.lowen@gmail.com)
Dr. Lawrence Leonard
(lleonar1@maine.rr.com)

Development of Electronic Natural History Identification Guides
October 2–6
(Monday and Friday are travel days)
Fred SaintOurs
(fred.saintours@comcast.net)

New Summer Forays in Mexico

The only NAMA member residing in Mexico, Gundi Jeffrey, and her husband Erik have been organizing week-long forays for visitors in various regions of their adopted land since 2000. For this year, they canvassed opinions from past participants, including many NAMA members, regarding preferred mushrooming locations. Based on the "voting results," two new areas—exciting for fungi abundance as well as scenery, culture and history—have been planned as foray bases:

July 9–16, 2006

The July tour will be in the diverse Sierra Gorda Ecological preserve in the central state of Queretaro. Spectacular mountains, old-growth forests, waterfalls, and deserts are among the fungi habitats to be explored, as well as renowned old mission churches, pre-hispanic sites and the ruins of Dalí-friend Edward James's surrealistic jungle estate.

August 6–13, 2006

The August excursion will be based in Oaxaca, specifically the Benito Juarez National Park, just northeast of the vibrant, cosmopolitan state capital. Local guides will take the group to favorite mushroom-hunting spots and will also serve a village family meal using some of the mushrooms found. The culinary aspects will peak with a day at the nearby famed cooking school of acclaimed chef Susana Trilling (books and PBS show), followed by a very special mushroom-focused dinner. Important archaeological sites and unique artisan crafts—pottery, rugs, fantastic carved wooden creatures—will be among other diversions included.

Both tours are limited to 16 participants plus staff and technical leaders and are all-inclusive with good lodgings, meals, wine, etc. Although the forays take place in mid-summer, the elevations in both cases (6,000+ ft.) will make for comfortable temperatures, especially compared to many areas "up north" at that season.

For more information see the website, www.mexmush.com, or call (from U.S./Can.): 011 52 (246) 461-8829.

Mycological Society of America / Canadian Phytopathological Society / American Phytopathological Society

Québec City, Québec, Canada
July 29–August 2, 2006

Joint annual meeting.

NAMA Annual Foray William Switzer Provincial Park

Hinton, Alberta, Canada
August 17–20, 2006

Details can be found at the NAMA website and inside this issue.

8th International Mycological Congress (IMC8)

Cairns, Australia
August 21–26, 2006

Details can be found on the website: www.sapmea.asn.au/imc8.

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Forays & Announcements,
cont. from page 3

New Mexico Mycological Society Annual Foray

August 24–27, 2006
Los Alamos, NM

Foray in northern New Mexico in piñon-juniper, ponderosa pine, and fir/spruce habitats. We will visit areas in Santa Fe National Forest and Valles Caldera National Preserve. NAMA members are welcome. See www.mycowest.org.

Clark Rogerson Foray

August 24–27, 2006

COMA's 9th Clark Rogerson Foray is based at Cave Hill Resort in Moodus, CT. This cozy resort has an outdoor pool, a small lake, and acres of grass and trees. Invited mycologists include Gary Lincoff, Sam Ristich, Roz Lowen, Sandy Sheine, and Leon Shernoff. The Salmon River State Forest and other nearby parks usually produce baskets of choice edibles and 300+ different fungal species. Activities include swimming, wine-tasting, mycophagy, and evening programs. Contact Don Shernoff at <donshernoff@yahoo.com> or (914) 761-0332 .

Alaska's Wild Mushrooms

August 25–27, 2006

Contact owners Mary Jane and Tony Lastufka at (907) 235-3633/345-2571, e-mail them at <ecotour@ptialaska.net>, or visit their website at www.tentandbreakfastalaska.com for more information; see also the March/April 2006 issue of THE MYCOPHILE.

Bavarian Mushroom Foray

Summer 2006

See the Posh Journey website (www.poshjourneys.com) or contact Freia Bradford at (719) 784-3838, email <freia@redgeckointernet.net>; or Helga at (775) 852-5105, email <contact@poshjourneys.com>. For details, see the Jan./Feb. issue of THE MYCOPHILE.

Asheville Mushroom Club Mushroom Fair

September 9, 2006

The Asheville Mushroom Club, a NAMA affiliate, would like to get the word out to all mycophiles: Western North Carolina is a great place to visit in the fall!

Exhibits at the fair include fungi identification tables, booths presenting scholarly topics by students from Warren Wilson College, UNC–Asheville, and ASU. Other features include mushroom identification book sales, oyster mushroom growing, shitake growing, and medicinal mushroom extract sales.

Taylor Lockwood and Coleman McCleneghan are the featured mycologists and speakers; others will be announced later.

The AMC Mushroom Fair will take place at Warren Wilson College from 9 AM to 5 PM. Classes will run all day and include Mushrooms of the Smokies (Coleman), Fantastic Fungi of the World (Taylor), Cooking, Dyeing, Advanced Mushroom ID (with microscopes), Medicinal Mushrooms, and Photographing Mushrooms.

For more information, see the web site of the Asheville Mushroom Club, www.main.nc.us/amc.

Foray Newfoundland & Labrador

September 15–17, 2006
Avalon Peninsula
Newfoundland, Canada

For information, list of faculty and guest faculty, and registration materials, please go to our website, www.hnhs.ca/mushrooms, or see the March/April 2006 issue of THE MYCOPHILE.

Laos in October

This exciting two-week foray will include collecting, field identification, and microscope work in the mountainous areas near Luang Nam Tha and Luang Prabang, supplemented by cultivation workshops, cooking demonstrations, and an opportunity to visit Luang Prabang, the ancient capital of Laos and a World Heritage City. Optional extras include a side trip to the Plain of Jars, famous for its remnants of Paleolithic culture and for its role in U.S. military history, and overnight stays in local villages. For more information about the region see www.boatlanding.com and follow the links.

The trip leaders are Dr. Edward Grand, a graduate of the University of Tennessee, where he studied Basidiomycetes, and Allison Brown, a horticulturist who has lived for more than 20 years in the region.

The group will rendezvous in Nong Khai, Thailand, and conclude in Luang Prabang. Organizers will assist participants with travel arrangements onward from Luang Prabang. The fee of approximately U.S. $1100 will cover transport (excluding airfare to Thailand), most meals, accommodations, use of laboratory equipment, and guided collecting trips with local experts. The trip will involve moderately strenuous walking that should not be difficult for people in good health.

For more information about the tour including proposed itinerary, email <mushroomtourlaos@gmail.com>.

Note that biological material cannot be taken outside of Thailand or Laos without prior permission.

Thailand Mushroom Ecotour Date Undetermined

For more information about this tour, please email Dr. Edward Grand at <edwardgrand@yahoo.com>, visit the website (www.mushroomresearchcentre.net), or see the March/April 2006 issue of THE MYCOPHILE.

This fungus knows how to have a ball!

In the January on-line issue of the research journal *Proceedings of the Royal Society B* comes an amazing discovery. Mimicry has evolved in a wide range of organisms and encompasses diverse tactics for defense, foraging, pollination, and social parasitism. (Move over, cuckoo.) The new master designer of impostor eggs is a genus of fungus called *Athelia,* some species of which trick termites into nurturing their young. Sclerotia, or "termite balls," are tough, filamentous orbs that can sprout into fungal colonies when dropped into piles of termite excreta, where competition for resources is lacking.

This extraordinary case of egg mimicry by a fungus, whereby the fungus gains competitor-free habitat in termite nests, was discovered by Kenji Matsuura, of Okayama University. The brown fungal balls frequently are found in egg piles of *Reticulitermes* termites. Phylogenetic analysis illustrated that termite-ball fungi isolated from different hosts (*R. speratus*, *R. flavipes* and *R. virginicus*) were all very similar, with no significant molecular differences among host species or geographical locations. There appears to be no significant effect of termite balls on egg survivorship. The termite-ball fungus rarely kills termite eggs in natural colonies. Even a termite species (*Reticulitermes okinawanus*) with no natural association with the fungus tended termite balls along with its eggs when it was experimentally provided with termite balls. Scanning electron microscopic observations revealed sophisticated mimicry of the smooth surface texture of eggs by the fungus. These results provide clear evidence that this interaction is beneficial only for the fungus; that is, the fungus cuckolds termites for its sole gain in this unusual example of egg mimicry. I was kindly sent a photo that clearly shows the termites tending the round orange fungus balls amid a pile of white eggs (see page 2 of this issue). Further information can be found in a related article by the same author in the journal *Applied and Entomological Zoology* (2005; 40[1]: 53–61).

Plant pathogenic fungus gets its punch from a bacterial endosymbiont

If the story, above, didn't have you scratching your head, this one will. From the journal *Nature* comes another amazing story of fungal evolution. This time, with the ubiquitous Zygomycete (sorry, no mushrooms here, folks!) *Rhizopus.*

A number of plant pathogenic fungi belonging to the genus *Rhizopus* are infamous for causing rice seedling blight, a plant disease typically initiated by an abnormal swelling of the seedling roots without any sign of infection by the pathogen. This characteristic symptom is in fact caused by the metabolite rhizoxin that has been isolated from cultures of *Rhizopus* sp. The phytotoxin (plant toxin) exerts its destructive effect by stopping mitosis and thus cell division in the plant host. Owing to its remarkably strong antimitotic activity in most eukaryotic cells, including various human cancer cell lines, rhizoxin has attracted considerable interest as a potential antitumor drug. Amazingly, the rhizoxin is not biosynthesized by the fungus itself, but by endosymbiotic (intracellular living) bacteria of the genus *Burkholderia*. One simply cannot imagine where our wonder drugs of the future will come from.

To read more see *Nature* (437[6]: 884–87).

Explosive-eating fungus

From a February issue of *The New Scientist* magazine comes word of an explosive-eating fungus. When explosives are used for mining or demolition, some may fail to detonate and get lost in the rubble. Robert Riggs of Texas, who recently filed a patent on his discovery, reckons the remedy could be to mix pellets of dormant fungal spores in with the explosive charge before inserting the wick into the explosive package.The dry spores lie dormant while the explosives are in storage and, if the charge detonates as intended, will be blown to smithereens. But if the explosive fails to detonate, water from the air should migrate down the wick and into the charge. The spores should then germinate and devour the charge, rendering it harmless.The white-rot fungus *Phlebia radiata* is particularly fond of high explosives, according to the patent. And the speed at which it gobbles the stuff up depends on the number of pellets added: five pellets per stick for slow degradation or 30 to make it safe after just a few days. Now that's a hungry fungus!

And on the subject of stories of amazing fungal evolution . . .

An article published by Roman Kaiser in a recent issue of the journal *Science* (311: 806–7) will blow your mind! Some flowering plants mimic the scent and appearance of mushroom fruiting bodies. Fungi may also mimic flowers. In addition, infection of plants by certain fungi can direct the plant to develop nonfunctional floral-like structures that nonetheless primarily serve the reproductive advantage of the fungus. These various mimicries may serve to attract insects that in turn spread fungal spores or plant pollen, thus facilitating sexual reproduction of the cryptic organism. The flower (yes, it's actually a flower!) shares an amazing resemblence to the underside of a gilled mushroom cap. Furthermore,

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Remembering Elizabeth Moses

by Ron Meyers

I received a letter from Elizabeth Moses's son several months ago in which he informed me that Elizabeth was in very poor condition and no longer able to appreciate the newsletter. But I was not aware that she had passed away until I read her obituary in the Fall 2005 issue of *Mushroom the Journal*.

I first met Elizabeth at the NAMA Foray at Angel Fire, NM—my first NAMA Foray. She was looking for Rod Tulloss, who was working on naming a mushroom Elizabeth had discovered growing below Tuttle Creek Dam north of Manhattan, Kansas. It was as a direct result of this mushroom that I got to know Elizabeth and her husband Will a lot better. When I assumed the editorship of *The Mycolog* from Skip Kay in January 1995, my first front page article was "At Last! A New Kansas Mushroom" (*Mycolog* 52), which related the discovery and naming of *Amanita populiphila* Tulloss & E. Moses *sp. nov.*

Of particular interest in the *Mycotaxon* description of the mushroom was the statement "In 1990, Moses and her husband cooked up a batch of *A. populiphila*, ate it entirely, and noticed no ill effects whatever. They enjoyed the mushroom again in May 1992 and note that it ranks as a good edible and that the stipe is 'pleasantly crispy.'" When questioned as to why she would take a chance on eating an unidentified *Amanita,* Elizabeth responded in an article "Letter from a McIlvaineian" (*Mycolog* 53): "[Charles McIlvaine] is, mycologically speaking, a father image to me, and I take him as a role model. I was, and still am, touched by his concern to vindicate the reputations of mushrooms 'falsely accused' of being poisonous, and to prove and publish their 'innocence.' He suffered no harm and neither have I."

Elizabeth goes on to state her cautious steps in trying a new mushroom but specifically mentioned that while *A. populiphila* had a volva (which she initially overlooked due to its fragility and depth), it did not have an annulus, leading her to believe it was among a non-poisonous group of *Amanitas*.

Following this, Elizabeth invited KVMS members to come to Manhattan when the mushroom was fruiting. Since this is a 90-mile drive and we were never sure when they would be up, it was some time before we made a visit; but when we were near there a couple years later, we decided to stop by. There were only a few mushrooms up. I had nothing to dig them out with and, thus, no photo opportunity, but Elizabeth promised she would call me when there was a good fruiting. So in the summer of 1998 Donna and I made the trip just to see Elizabeth's mushrooms. They were amazing. In a large field near cottonwood trees (which inspired the name of the mushroom) there were hundreds of them. This time I was prepared and was able to get several photos.

On our visits to Elizabeth she informed me that her eyesight was failing, and much as she loved her mushroom books, she was no longer able to enjoy them. Thus, she donated her library to the club, and we auctioned off the volumes to members.

In August 1999 Elizabeth called again and requested that Donna and I come to Manhattan. She said she had a special reason. When we arrived, she presented me with her much beloved book and viewmaster slides of Alexander Smith's *Mushrooms in Their Natural Habitat*. Along with this was a handwritten note stating that this was a gift she wanted me to keep. Needless to say I was overwhelmed. Elizabeth said she really hated to part with these materials, but she was no longer able to see the pictures. She wished she could somehow project the slides onto her television. Knowing this, I experimented with my video camera and a makeshift device to hold the slides and provide some backlight. While they were not very professional, I was able to make a video that showed all of the photos. She was very grateful.

Since I knew Elizabeth was no longer able to read small print, for several years I produced one copy of *The Mycolog* just for her, in bold print with 16-point type. She informed me that she enjoyed this. I continued to send her the copies after she moved to Pennsylvania until I received the previously mentioned letter from her son.

Elizabeth was one of the most dedicated amateur mushroomers I have encountered. She was a member of the North American Mycological Association long before our club was established. I am sure that her discovery of a new mushroom and her help in describing it were some of the most memorable events of her life.

Elizabeth frequently contributed articles for *The Mycolog,* including an amusing encounter with a "Poisoned Mycophile" who had consumed *Chlorophyllum molybdites* and thought it was *Agaricus campestris,* which he had collected and eaten for years. After Elizabeth patiently explained about the difference in gill color, he returned a few days later with a fresh batch of *C. molybdites* which he felt sure were *Agaricus*.

In 2002 Elizabeth published a book of her memoirs of growing up in the south with sisters who were favored over her. The book is titled *To Bury Caesar.*

It was a pleasure to know Elizabeth, and I am very happy she was a member of our club. She will certainly be missed.

Fungi in the News,
cont. from page 5

the flower (a tropical orchid species named *Dracula chesteronii*—see page 20) even produces the same compound that is responsible for the the scent and flavor of mushrooms, 1-octen-3-ol, thus completing the charade. (And since you have to ask, yes, there are other species of *Dracula* orchids, including one with what has to be one of the best all-time scientific names: *Dracula vampira*.) My thanks to Roman Kaiser for sharing several photos of this amazing orchid.

A fungus that's a hazard to your brain . . .

As if Hurricane Katrina and Rita cleanup crews didn't have enough to contend with, a report in an upcoming issue of the journal *Environmental Health Perspectives* gives warning of one more threat. A common black mold that grows on moist cellulose-based materials, from wallboard and ceiling tiles to cardboard, creates a toxin that can kill certain brain cells. In an experiment with mice, the chemical, satratoxin, targeted neurons running from the inside of the nose to the brain's smell center.

Jack R. Harkema of Michigan State University in East Lansing is publishing his findings that this is the first demonstration that a neuron can be killed by satratoxin, and more frightening, that the damage can be contracted through the air (without actually coming in contact with the fungus). Among the exposed nasal cells, the toxin proved lethal only to those that sense odors.

The black mold *Stachybotrys chartarum,* commonly found in water-damaged buildings, had already been linked to people's respiratory irritation and asthma. To identify nasal effects, Harkema and others made mice inhale a single dose of satratoxin and then monitored tissue changes over the next month. Within a day of exposure, 75 to 80 percent of the olfactory neurons in the animals' noses had died. Although these cells can regenerate, after a month, the researchers found that many had not yet been replaced. As little as 25 micrograms of toxin per kilogram of mouse-body weight elicited this neural toxicity. This is a considerably higher dose than would likely occur when humans are in an infested building. The scientists now plan to evaluate whether prolonged exposure to even lower doses—such as could assault hurricane-cleanup crews—might trigger similar changes.

. . . and one that's a hazard to your eyes

The Associated Press (AP) recently reported that some U.S. doctors are seeing a disturbing increase in the number of rare eye infections among contact lens wearers. Rare, because the infection is caused by a fungus.

The federal Centers for Disease Control and Prevention (CDC) is watching the situation and has received reports of about 50 possible cases in 12 states this year so far. But because tracking of the disease is spotty, the CDC cannot say for certain whether cases are on the rise. Republic of Singapore health officials noticed a spike in January and discovered 39 cases involving contact lens users from 2005 to February of this year. Cases have also been reported in Malaysia and Hong Kong.

The big question is: Why now? Everyone seems baffled, as the fungus has been around seemingly, forever (and contact lens usage nearly that long). The fungus, a species of the cosmopolitan genus *Fusarium,* is commonly found in plant material and soil in tropical and subtropical areas and just about anywhere else anyone's thought to look. But most species of the fungus are saprobes or plant pathogens.

Without eye-drop treatment, which can last two to three months, the infection can scar the cornea and blind its victims. Symptoms can include blurry vision, pain or redness, increased sensitivity to light, and excessive discharge from the eye. It is not transmitted from person to person. National Public Radio (NPR) also covered the story with CDC officials recommending, as prevention, that contact lens wearers should wash their hands with soap and dry them with a lint-free towel before handling their lenses or touching their eyes. Furthermore, lens storage cases should be replaced every three months, and the solution should be changed daily. During the NPR story, USDA Plant Pathologist and *Fusarium* expert (and Mycological Society of America member) Amy Rossman said, "the eye is a perfect environment for fungi as it's wet and . . . all you need to add is a nutrition source. The plastic contact lens case can support fungi, as they love to eat plastic."

Some news sources have reported that the fungus outbreak is linked to Bausch & Lomb's ReNu with MoistureLoc contact lens solution. Although investigators say there is no clear link, the alarm over the "epidemic" has led to stores pulling the product from their shelves, B&L halting shipments of the product, and (as of this writing) the price of B&L stock dropping. I believe the matter is little more than media sensationalism as there have been tens of cases, worldwide, and more than 30 million contact lens uses in the U.S. alone. But now you know the story.

***From the British Mycological Society's* Mycologist**

In the latest issue (2006, volume 20 part 1) we find a fascinating paper by Nieves-Rivera and White titled "Ethnomycological notes. II. Meteorites and fungus lore." The title says it all. Incidentally, part I of this series of papers dealt with fungi and lightning bolts and appeared in the Hungarian magazine *Moeszia*.

Also of interest is a review article on the genomic sequencing projects of fungi. To date, the

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Fungi in the News,
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complete DNA sequence for 18 species of fungi have been determined. Several more projects are ongoing. Of course, the majority are economically important plant pathogens.

And, ironically, the "Fungal Foes" (an ongoing feature each month) are fairy ring mushrooms. (You may have ascertained that this is the very theme of this issue of THE MYCOPHILE!) The author, R. T. V. Fox of the University of Reading in the U.K., notes 50 species of fungi known to cause fairy rings and describes how the presence of the fungus can lead to dark green rings on lawns, as well as dead patches of grass inside the ring. As the process is covered elsewhere in this issue, I won't go into detail.

***From the Mycological Society of America's* Mycologia**

The latest issue of *Mycologia* is the Sep/Oct '05 issue (97:5). Although hopelessly late, as usual, *Mycologia* is always packed with great research papers. One paper that fascinated me was on the evolution of nematode-trapping fungi by a team from China led by Li *et al.* Several genera of fungi, including *Pleurotus, Coprinus, Hohenbuehelia,* and *Arthrbotrys,* are known to catch and kill nematodes (tiny unsegmented worms living in soil) that are used as a source of nutrition. *Arthrobotrys* spp. have long been of interest as an economically important control for plant pathogenic nematodes, a scourge to growers of field crops and fruit trees.

Also of interest to mycophiles is "Morphological and molecular systematics of Rocky Mountain alpine *Laccaria*" by Todd W. Osmundson, Cathy L. Cripps, and Gregory M. Mueller. Dr. Cripps will be the Chief Mycologist at this summer's Annual Foray in Alberta, where much of our foraying will take place near the alpine zone—the focus of the authors' study. The alpine zone comprises habitats at elevations above treeline, and macromycetes play important ecological roles as decomposers and mycorrhizal symbionts here as elsewhere. *Laccaria* is an important group of ectomycorrhizal basidiomycetes widely used in experimental and applied research. The systematic study of alpine *Laccaria* species using morphological, cultural and DNA sequence data revealed five taxa in the Rocky Mountain alpine zone: *L. laccata* var. *pallidifolia, L. nobilis* (the first published report for arctic-alpine habitats), *L. pumila, L. montana,* and *L. pseudomontana* (a newly described taxon similar to *L. montana* with more ellipsoidal, finely echinulate basidiospores). All occur in the southern Rocky Mountains of Colorado; however, only *L. pumila* and *L. montana* were found on the Beartooth Plateau in the northern Rocky Mountains of Montana and Wyoming. All are associated with dwarf and shrub *Salix* species, with *L. laccata* var. *pallidifolia* also associated with *Dryas octopetala* and *Betula glandulosa*.

The return of an American icon

When I opened the latest issue of *Audubon* (Mar/Apr '06, 27–35), I was delighted to find a story that reminded me of last year's Annual Foray in Wisconsin, at which foray-goers were treated to a hike in one of the largest remaining stands of American chestnut trees. As you're probably aware, a fungus that came to North American around 1900 has been steadily wiping out these trees, which were once the dominant species throughout much of the eastern continent. But thanks to the hard work of a few dedicated individuals, the American chestnut may make a comeback. For more information, pick up a copy of *Audubon* or visit the websites of the American Chestnut Foundation or the American Chestnut Cooperator's Foundation. You'll find tons of information, history, and great photos.

Letter to the Editor . . .

Steve Trudell's review of the Halling and Mueller guide to the mushrooms of Costa Rica's Talamanca Mountain (Mar/Apr '06 issue of THE MYCOPHILE) states that no previous guides to Costa Rican fungi exist. In fact, there are two volumes, titled *Macrohongos de Costa Rica,* published by INBio (National Biodiversity Institute of Costa Rica) with Halling and Mueller as contributing authors to the second volume. The author of the first volume is Milagro Mata, who is also the primary author of the second. Both paperbacks are available on the INBio website (www.inbio.ac.cr) for $14 plus about $4 shipping, and descriptions are in both English and Spanish. —Regards, Joel Horman

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Recently published

The 164-page field guide *Mushrooms and Other Fungi of the Black Hills and Surrounding Area,* by Audrey Gabel and Elaine Ebbert (Spearfish, SD: Black Hills State University, 2004), includes over 150 color photographs, descriptions of common fungi, keys to genera and/or species of the major groups, using field characters, a glossary, a mushroom calendar of expected collection times, plus supplementary information to assist with identification. To order, contact Mike Jastorff at the Black Hills State University Bookstore, 1200 University, Spearfish, SD 57799. $16.95.

Soon to be published

"Please consult our website, Mushrooms-Miller.com, for information on our new field guide: *North American Mushrooms,* a Falcon Press Field Guide. It will be published in April with 570 color plates, glossary, extensive bibliography, and a visual key. The price will be $25.95. The website gives examples from the guide." —Dr. Orson K. Miller, Jr. and Hope H. Miller, Box 858, McCall, ID 83638-0858. Tel 208-634-2597; email <orsonk@frontiernet.net>.

How to Get (Really) Sick from Eating Wild Mushrooms

by Dave Miller

As most of you are abundantly aware, last year's mushroom season was nothing short of spectacular. After a protracted hot, dry spell from mid June into late July, the rains returned to our place in northern Ohio. We were blessed with a series of several strong thunderstorms and then the remnants of Katrina, followed closely by those of Rita, gave much of our state between two and four inches of rainfall each. Some remnants!

I know some—perhaps many—of you might be moved to complain that I'm exaggerating the amount of rainfall, because your rain bucket was wanting and so you didn't have such a good collecting year. Give me a little slack here! I'm only reporting what happened in the Oberlin environs. At any rate, all this rain made my last year of teaching "The Fungi" a real joy and very easy. No need to scrounge through the woods for a few shriveled polypores. In fact, we had so many fleshy fungi to work with that we gave short shrift to the leathery-woody types. Of course, mixed in with all the great edibles were the usual suspects of poisonous mushrooms to tempt the unwary.

And we had a real doozy of a poisoning here right in the backyard of your editor [*see Ed. note below*]. A retired English professor has been gathering edible mushrooms here for years now and presumably should know the difference between an edible and its poisonous look-alike. In fact, he does know the difference! He just got a little impatient.

Along with our abundant rains, we had a pretty hot summer, and since the poisonous Green Gill, *Chlorophyllum molybdites,* is more common the further south you go, we don't usually have it with any great frequency up here. But this summer was a fairly hot one, and from late August through mid-September my students and I saw four sizable collections of it, all in its favorite grassy habitat. It's a very impressive mushroom: robust, graceful, and, like the Destroying Angel, very aesthetically appealing.

The professor apparently found them too appealing to pass up and picked a bunch of them to take home for a closer look. He is something of a local expert on edible mushrooms and was fully aware of the poisonous nature of the Green Gill and its highly esteemed edible look-alike, *Macrolepiota rachodes* (the Shaggy Lep), which he hoped these Green Gills were. He and his wife, a local physician, checked for a spore print, but laid the cap down onto white paper, so when they saw no evidence of any green spores, they decided that the spore print must be white and was just too faint to see, leaving the only option for an ID of their specimens as the Shaggy Parasol. They cooked them up that evening and ate them. They told me later that they hadn't tasted as good as the Shaggy Parasols they'd had in the past, and they wished they had paid more attention to their taste buds.

Later that night their gastrointestinal tracts rebelled rather violently. One of them immediately expelled the remains of the mushrooms (enough said) and felt reasonably well the next day, sort of like recovering from a moderate case of food poisoning. The other victim did not regurgitate them and spent a couple of very uncomfortable days until the toxin(s) worked themselves, at a more leisurely pace, through his body.

I've eaten Shaggy Leps a number of times and find them an excellent edible, firm and meaty with a rich, nutty flavor. But this incident made me wonder if I'd ever want to try them again. We later found several fruitings of Shaggy Leps, and eventually my students and I convinced ourselves we could tell the difference between them. Several features help one to distinguish between them.

Habitat: Green Gills feed on grass thatch, so they are found in lawns. However there *can* be trees nearby. Shaggy Leps I usually find near spruce, especially blue spruce, though I've also found them near an old apple tree. They may be growing in grass near a spruce. But you already know, I'm largely a suburban mushroom collector, so I'd better quote *Mushrooms of Northeastern North America,* where it's listed as being found "among leaves, conifer needles, and wood chips, grassy areas, and in gardens." Thus, the habitat isn't exactly a slam-dunk.

Spore color: This should be a no-brainer, but Green Gills seem to take some time after reaching their full size before spores form profusely enough to show their true colors. Hence the mix-up. I picked a fully expanded one of these to get a spore print, and it took it two days to develop mature green spores! If you find a collection of specimens of different maturities, check the oldest ones for a grayish-green cast to their gills. And if you're doing a spore print, be sure to use part white and part dark paper so that, if white spores are being deposited sparsely, you'll see them against the darker paper.

Color reaction: This is a pretty good way to distinguish between them, which I heard about from our own Dick Grimm. To quote Dick: "One can tell a Shaggy Lep (*Macrolepiota rachodes*) from a *Chlorophyllum molybdites* (*Lepiota morgani*) in the early stages, when the gills of both mushrooms are white. Simply pull the stem from the socket of the cap and wait a few minutes. Both the socket as well as the stem apex that was removed from the socket turn a saffron salmon color. If the mushroom is old it is reluctant to turn color. However, if the mushroom is old, the gills would be slate green in the poisonous *Chlorophyllum*."

Continued on page 10

Alberta Bound!

Plans for what promises to be a super experience continue to develop for our Annual Foray this year in Hinton, Alberta, Canada, August 17–20.

To our delight, Dr. Cathy Cripps has agreed to be our Chief Mycologist. Cathy has attended several NAMA forays in the past and serves as faculty at Montana State University in Bozeman. She specializes in fungi of the alpine and subalpine habitats—the very areas we will be encountering. It will be great to have her expertise in her own climate zone.

Our Canadian friends have selected foray sites intended to show us the variety of the region. This will also be the first time we have ever tried hunting mushrooms from canoes, or at least using them to get to special places. All of our standard programs for beginners— photography, toxicology and, of course, mycophagy—are in the works. We can also look forward to an update from Dr. Pat Leacock on our voucher program, which is becoming an increasingly significant resource as we accrue specimens from across the continent and the collections from this foray will certainly expand this data.

Orson and Hope Miller will be with us again. We look forward to Orson's sharing with us his current adventures. We also hope to celebrate their new book, eagerly anticipated by many of our members. We're thinking of a book-signing occasion.

We have secured additional rooms to those at the Hinton Training Center at Black Cat Ranch, which is about 20 minutes from the Center and will be one of our foray sites. The rooms there are double occupancy and are reasonable at $100 per room per night, Canadian. We recommend an early reservation, should this option appeal to you. The phone number there is (800) 859-6840. Black Cat Ranch is not available for the trustees, unfortunately.

There are several campgrounds in the area, but we have reserved the one adjacent to the Training Center for any attendees who would appreciate sleeping under the stars. It is managed by the Friendship Center; phone is (780) 865-5189.

The Training center rooms are also double occupancy with non-coed bathrooms in the halls. There are elevators, but air conditioning is unnecessary in Hinton. Please bring a wrap for the cool evenings. We will have our breakfasts and lunches at the Training Center but move across the road to the Hinton Community Center for our catered evening meal and program. Our entire group can be more easily accommodated in that facility.

Edmonton, the airport of choice, is a little less than three hours from Hinton. Edmonton Club members have offered a shuttle service to and from the airport if there is enough interest and are already investigating possibilities. Please let Ann Bornstein know as soon as possible if you are interested in shuttle transportation.

Hinton is relatively close to the enticing tourist areas of Jasper (30 miles), Lake Louise, and Banff, so many foray attendees may truly wish to plan an additional visit to some of these areas. Calgary is about six hours away by car. On a personal note, I will never forget lying in a tent just out side Banff and awaking to an elk brushing the nylon as she grazed within touching distance. We could not have been more than a foot apart.

This is stunning area—hope to see you there!

—Allein Stanley

How to Get Really Sick, continued from page 9

Michael Kuo (of the MushroomExpert website) notes, "I know very experienced mushroom hunters who have poisoned themselves, mistaking [Green Gills] for closely related edible mushrooms like *Chlorophyllum rhacodes* and *Macrolepiota procera*." (*Chlorophyllum rhacodes*!!! Good grief! How can a white-spored mushroom have green gills??? Chlorophyllum means literally green gills!) Again, Michael Kuo: "*Chlorophyllum rhacodes* has been called '*Lepiota rhacodes*' or '*Macrolepiota rhacodes*' in the past, but recent DNA studies (see Vellinga, 2002) have given the mushroom a new home in the genus *Chlorophyllum* alongside the very similar *Chlorophyllum molybdites*." New home, indeed!

By the way, you may have noticed that I've been citing the website MushroomExpert quite a lot. It is a great site! Much of what is there is Michael Kuo's doing. You can enter the name of a fungus you're interested in, and chances are it will be among those on their list. Each species has multiple photographs at various stages of its development (as with *Chlorophyllum molybdites*) or in the various forms it takes (as with *Abortiporus biennis*) as well as extensive information on look-alikes, features of the fruiting bodies, spores, etc.—all the ingredients of a field guide and more. Plus, there are innumerable other topics you can link to, such as Rules for Boletes, The Deadliest Toxins, Digital Photography Tips, and Mushroom Taxonomy. Under the latter is an extensive article (also by Michael Kuo) entitled "The Evolution of a Great Big Headache," which does an outstanding job of explaining why mushroom taxonomy (the naming and classifying of mushrooms) is currently in such turmoil.

It even made me feel a little better about calling the Shaggy Lep a *Chlorophyllum rachodes,* though only just a little.

[*Dave Miller is a professor of Biology at Oberlin College in Ohio; he belongs to the Ohio Mycological Society and edits their newsletter, where this article originally appeared. It was reprinted here with permission. —Britt*]

The North American Mycological Association
NAMA '06
Hinton Training Center, Hinton, Alberta, Canada
Thursday, August 17th, through Sunday, August 20th, 2006

Ann Bornstein, Registration
336 Lenox Ave., Oakland, CA 94610-4675
<gramma.ann@att.net> • Tel. (510) 839-2487

Complete both sides of this form and send to Ann Bornstein with your check, payable to ***NAMA '06****.*

Name(s): _____

Address: _____

City, State, Zip: _____

Phone: _____ Email: _____

Names and club affiliation for name tags: _____

Assign roommate: ❑ Male ❑ Female I want to share a room with _____

REGISTRATION

		U.S. $	Can $	
Complete package (Thurs. noon to Sun. lunch)	#_____	@ $290 each	$333 each	$_____
Single supplement	#_____	@ $ 78	$ 90	$_____
(includes 3 nights, 9 meals, and all programs)				
Hinton Campground Camping	#_____	@ $252	$290	$_____
(includes programs, 6 meals, no breakfasts)				
NAMA Trustees meeting Wed. August 16th	#_____	@ $ 65	$ 75	$_____
Single supplement	#_____	@ $ 40	$ 46	$_____
(includes 2 nights, breakfast and lunch only)				
NAMA membership (required if not current)	#_____	@ $ 35	$ 40	$_____
Late fee (afterJuly 1)	#_____	@ $ 50	$ 57	$_____
Mycology student discount: subtract	#_____	–$100	–$115	$_____
School _____				
Commuters: (all programs, lunches and dinners)	#_____	@ $252	$290	$_____
Total				$_____

Do you require vegetarian meals or have other special concerns? _____

Are you a vendor? Items for sale _____ Amt. of space desired _____

We must have a signed release for all adults attending the foray. See next page.

LIABILITY RELEASE AND PROMISE NOT TO SUE

I understand that there is some risk in participating in a mushroom foray and conference: all those risks one assumes by being away from home, risks associated with moving about in fields and woods, risks involved in eating wild mushrooms, risks of losing personal property by theft or misplacement, and all other expected and unexpected risks.

In registering for or attending this foray, I agree to assume total responsibility during this event for my own safety and well-being, and that of any minor children under my care, and for the protection of my and their personal property. I release the North American Mycological Association (NAMA), its trustees, officers, employees, contractors, and all other persons assisting in the planning and presentation of this event from liability for any sickness, injury, or loss I or any minor children under my care may suffer during this event or as a result of attending and participating. I further promise not to file a lawsuit or make a claim against any of the persons listed above, even if they negligently cause me or my minor children injury or loss. Finally, I agree to hold NAMA harmless from any liability it may incur as a result of any damages to Hinton Training Center property that I may cause.

This release and promise are part of the consideration I give in order to attend this event. I understand that it affects my legal rights. I intend it to apply not only to me but to anyone who may have the right to make a claim on my behalf.

Signature 1: _____ Date: _____

Print Name 1: _____

Signature 2: _____ Date: _____

Print Name 2: _____

VOLUNTEER OPTIONS

If you can help in any way, please let us know. The volunteer time of our members is what continues to make NAMA forays such a success and great time for everyone. The coordinator will contact you with details prior to the foray.

❑ Display & identification area _____
❑ Set up ❑ Assist identifiers ❑ Clean up

❑ Mycophagy _____
❑ Set up ❑ Preparation (Sat.) ❑ Clean up

❑ Raffle _____
❑ Solicit prizes prior to foray ❑ Assist at foray

❑ Other: _____

_____

_____

BOOK REVIEWS

***Flora Agaricina Neerlandica* (*Mushroom Flora of the Netherlands*)** Vol. 5: Agaricaceae. M. E. Noordeloos, Th. W. Kuyper, E. C. Vellinga, eds. Rotterdam: A. A. Balkema Publishers, 2001. 169 pp. ISBN 90-5410-494-5 (cloth). $89.95.

The *Flora Agaricina Neerlandica* (FAN for short) consists of a series of volumes described by the editors as "critical monographs on families of agarics and boleti occurring in the Netherlands." Despite the small size of that country (about twice as large as New Jersey), a large number of fungi occur there, and the mycoflora of the Netherlands is among the better known ones. The editors all are professional mycologists who are well regarded internationally so the series carries high credibility in the mycological community.

The present volume covers the Agaricaceae. As you would expect, that includes the genus *Agaricus*. However, if you haven't been following the taxonomic changes that are being made, you may be surprised to find the lepiotas (in the broad sense) included here as well. Thus, you'll find the genera *Macrolepiota, Chlorophyllum, Leucocoprinus, Leucoagaricus, Lepiota, Chamaemyces,* and *Cystolepiota,* as well as *Melanophyllum* treated here.

Like the previous volumes, this one is divided into General and Taxonomic parts. Here, the general part includes Scope, Methods, and Presentation (including a map of the Netherlands and a list of abbreviations used in the text and drawings); Glossary; Abbreviations of Authors' Names; and Bibliographic Abbreviations. The taxonomic part includes keys and descriptions of the included taxa. Typically in this series, each genus is handled by a different author. In this volume, only two authors are involved—Maruke Nauta for *Agaricus* and *Allopsalliota*, and Else Vellinga for all of the lepiotoid genera and *Melanophyllum*.

The keys make liberal use of technical terminology and microscopic features; thus they require some experience in identification, as well as a microscope and chemical reagents. Each species description includes the full name, list of synonyms, lists of sources for illustrations and descriptions, Dutch common name, comprehensive description of macro- and microscopic characters and chemical reactions, and summary of habitat and distribution both within and outside the Netherlands. Many entries also include comments concerning look-alikes, taxonomic rationale, or emphasis of key identification features. Each description includes high quality line drawings of whole sporocarps, a sporocarp in long-section, spores, and, in some cases, cystidia. Despite the authors being Dutch, the text is in English: perhaps not flawless, but with few awkward spots.

Although many of the Dutch *Agaricus* and *Lepiota* species have not been recorded in North America, a rather substantial number have, so this volume will be useful for identifying fungi here, especially in the northern U.S. and Canada. In addition, it provides clear descriptions and taxonomic assessments of the Euro-species that will allow critical comparisons to be made between our mushrooms and theirs. Which ones are the same and which are different? Else Vellinga's work with lepiotas since taking up residence at UC Berkeley already has shown that such comparisons can produce valuable results. For instance, she demonstrated that many collections that have passed as *Lepiota clypeolaria*, *L. ventriosospora*, and *L. fusispora* in both North America and Europe actually represent *L. magnispora,* a species described from North America by W.A. Murrill in the early 1900s. The availability of this series and other recent publications from Europe will make more such enlightening comparisons possible.

This is not a book to page through while sitting in an overstuffed chair by the fire as you might do with your color-photo guides. However, if you are serious about identifying the fungi you find, this book and the others in the series can be a big help to you, even if they don't provide all the answers.

Note: Previous volumes in the series all are still available, although only in hard cover, from CRC Press ($89.95; 1-800-272-7737; www.crcpress.com). They include Entolomataceae—*Rhodocybe*, *Clitopilus*, and *Entoloma*, including *Nolanea* and *Leptonia*, (Vol. 1); *Pleurotus*, *Phyllotopsis*, *Lentinula*, *Lentinus*, *Volvariella*, *Hygrocybe*, *Camarophyllus*, and *Hygrophorus* (Vol. 2); Tricholomataceae—tribes Hygrocybeae, Clitocybeae, Laccarieae, Collybieae, Marasmieae, Myceneae, Resupinateae, Panelleae, Pseudohyathuleae, Macrocystideae, Rhodoteae, and Biannularieae (Vol. 3); and *Psilocybe, Pholiota, Tricholoma, Porpoloma, Tricholomopsis, Melanoleuca, Baeospora, Hydropus, Megacollybia, Mycenella, Oudemansiella, Strobilurus,* and *Xerula* (Vol. 4).

While this review has been in the queue, Volume 6 has been released, covering *Coprinus*, *Bolbitius*, *Conocybe*, *Pholiotina*, and *Agrocybe*. I plan to cover it, as well as do a more taxonomically focused assessment of the series, in a future review.

— *Steve Trudell, Seattle, Washington*

Morels, by Michael Kuo. Ann Arbor: The University of Michigan Press, 2005. 206 pp. with 200 + color photos. ISBN 0-472-03036-1. $27.95

By now everyone should be familiar with Michael Kuo through his incredible website MushroomExpert. For the uninitiated, it is an online

Continued on page 14

Book Reviews, cont. from page 13

mushroom guide with loads of terrific photos, keys for identification, maps, and lots more. (See also the end of the Miller article on page 10.) Although the author has written extensively on the subject, this is his first full-length book.

Morels hit the shelves late last year and is just in time for the 2006 morel season (currently getting started in the South, as I write this). The book has a lot to offer the morel enthusiast. There is all the lore that we mushroomers love to tell and retell while foraying in the woods with friends—much involving the uncertain (even to the experts) taxonomy of this group of ascomycete fungi and kin (*Gyromitra, Verpa*, etc.). To that end, Michael began the Morel Data Collection Project that receives specimens from all across North America (from folks like you and me) in an attempt to resolve the taxonomy once and for all. While the project is ongoing, the latest findings are reported in his book and are intriguing.

Besides the science, there's plenty to entertain the reader. I laughed out loud reading his account of his trip to a huge morel festival in Michigan where he met up with Nik Money, author of *Mr. Bloomfield's Orchard* (one of my favorite all-time mycological reads). As is the way of the fickle morel, the two mushroom experts were nearly skunked! Completely embarrassed, they found only a couple of tiny morels between them.

Kuo, whose day job is teaching English at Eastern Illinois University, spends much of his time (mostly through his website and lectures) dispelling myths about edible and poisonous mushrooms. I especially enjoyed his funny limericks on how to remember if a mushroom is edible. And here's a good reply to a query from the Frequently Asked Questions page at MushroomExpert:

Q: How do I kill these mushrooms?

A: Now, honestly. Would you go to www.eagles.com and ask for information on how to shoot eagles? Unless the mushrooms are growing in your living quarters, you will receive a form letter in response, telling you that mushrooms in your yard can't really be killed without killing everything else, that you should learn to enjoy them, that you should train your children and/or pets to stay away from them, and that if you're worried what the neighbors think of your yard, you need to rethink your priorities in life.

I highly recommend *Morels.* The text is easy to read and enjoyable at any level of expertise. The photos, mostly provided by Mark Davis, as well as some familiar NAMA folks, are outstanding and plentiful. During a recent phone conversation, Michael told me to soon expect his next book, *One Hundred Edible Mushrooms,* plus some other projects in the works. I can't wait! —*Britt*

Mushroom
The Journal of Wild Mushrooming

Other magazines urge you to subscribe, but
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P.S. How did you hear about Mushroom the Journal?

Index Fungorum

by Steve Nelsen

Index Fungorum is a remarkable community resource for mushroom enthusiasts, currently coordinated and supported by CABI Bioscience,[1], CBS[2], and Landcare Research[3] (the custodians). "It is free of any charge to the community on a non-commercial use basis. It should be cited as www.indexfungorum.org; a more formal citation should include the names of the custodians as above and the date of access."

It is also remarkable because it provides a wealth of solid information of the sort that is all too scarce on the web, most of which consists of out-of-date to even wrong nomenclature. It tries to include all assignments made, often with a recommended current name. The last time I logged on it mentioned "385351 records online." To quote from the web site (www.indexfungorum .org/Names/IndexFungorumPartnership.htm), "The Index of Fungi is a publication from CABI Publishing compiled by CABI Bioscience and currently provides the majority of recently published names. The production of this publication entirely depends on subscription income under the current business model. Certain data elements (name string, author string, year of publication) from the Index of Fungi are made available through Index Fungorum. The remaining data elements are not immediately available but are made so after five years. In the event of the cessation of the compilation of the Index of Fungi, the custodians will attempt to ensure a mechanism for the continuation of notification, through Index Fungorum, of newly published names."

Life is classified on this wesbite into 11 *Kingdoms*: Algae, Animalia, Bacteria, Chromista, Cyanobacteria, Fungi, Hepaticae, Monad, Plantae, Proteobacteria, and Protozoa. Fungi are placed in five "current" Phyla (Ascomycotina, Basidiomycota, Chytridiomycota, Glomeromycota, and Zygomycota), as a seemingly unfortunate *Incertae sedis*[4] (Latin for "uncertain position," I believe; one can never quite tell whether a phylum or smaller division down to family is intended except through context) and six listed as "Fossil whatsoever" Phylla (which are of less interest to people who walk in the woods). The most surprising to me was stuffing slime molds into an *Incertae sedis* of Protozoa where they must be quite uncomfortable. The names of dozens of people, many of them professional mycologists, who have provided data are included.

The names are color-coded: blue links are for names for which there is "no taxonomic opinion available" (perhaps odd since we are referred to the taxonomist whose opinion it was; nonetheless we know what they mean), red links are misapplied names (names which have been used in a sense which is different from that as represented by the type of the name), green links are names where a taxonomic opinion has been expressed and lead directly to the appropriate page.

I am bewildered by what criteria they use for deciding what is the "current name." It certainly has little to do with the date of the last monograph. They seem to like Singer's and dislike Smith and Hesler's opinions on *Pholiota,* to the extent of refusing to list S&H transfers from *Flammula* to *Pholiota,* which seems odd since nobody I have seen uses *Flammula* anymore.

NOTES

1. CABI Bioscience: "A leading not-for-profit enterprise specializing in sustainable solutions for agricultural and environmental problems."

2. Perhaps not quite what an American would expect: Centraalbureau voor Schimmelcutures is "an institute of the Royal Netherlands Academy of Arts and Sciences (KNAW) and situated in Utrecht—maintains a world-renowned collection of living filamentous fungi, yeasts and bacteria. The Institute's research programs principally focus on the taxonomy and evolution of fungi as well as on functional aspects of fungal biology and ecology, increasingly making use of molecular and genomics approaches. The institute employs circa 50 personnel, among whom 17 are scientists." Databases include *Filamentous fungi* (37,000 strains), Yeasts (6,500 strains available from the CBS collection as well as up to 900 yeasts species descriptions (regularly updated). A taxonomic database of more than 23,500 names and a bibliographic database of about 10,000 records are available.), *Actinomycetes* (1,200 strains). *Aphyllophorales* (more than 30,000 names). *Fusarium* (more than 1,500 names). *Anamorph-Teleomorph* (more than 7,000 names). *Penicillium* (more than 500 strains) *Phaeoacremonium,* and *Pseudallescheria/Scedosporium.*

A particularly interesting entry on the CBS website is J. Sowerby's *English Fungi* Vol. 1, from 1797 (120 colored drawings, each downloadable).

3. Manaaki Landcare Research: "Making a difference for a truly clean, green, and sustainable New Zealand. At Landcare Research, we are focused on science that benefits New Zealand by protecting our natural heritage, enhancing primary production and other businesses, and improving the quality of the environment for our communities. Together we can make a difference for a truly clean green New Zealand."

4. It includes 441 genera labeled "name not currently in use," including ones that obviously are, like *Tremella*, which when searched in the */Names category produces 444 entries when it is searched as a genus, several listed as the current name. Maybe the *Tremella* that is in use has a different author after it, but since hardly anyone ever mentions the author, such information can be highly misleading. Of course, one should not expect consistency from Internet information; the best we can hope for access to stuff.

[*I have found this site useful on numerous occasions! Many thanks to the author for this contribution. Steve Nelsen is a Chemistry professor at the University of Wisconsin in Madison and a member of the Wisconsin Mycological Society. —Britt*]

Honey Mushrooms and Honey Bees

by Dean Abel

Saturday had been a beautiful sunny November day, but I was busy with domestic chores and did not venture outside. Sunday the 13th was cold and windy, yet I was itching to do something. Damian Pieper suggested we call up Marti Freund and Jeff Borchert and take them up on their offer to hunt for honey mushrooms in their woods south of Iowa City. It might be the last chance of the season.

As we headed out, clouds formed threatening rain and then parted to let through a beam of sun. The trees rocked back and forth in the rising wind. What kind of day would it be? Mushroomers often curse the missed opportunity of the perfect day before, or else they risk waiting for the rain that never comes, and then it is too dry.

We turned into their driveway and passed the garden now asleep for the winter. Beehives sat at the edge of the woods. We parked by the house at the top of the hill, where Marti and Jeff welcomed us and assured us that once we were down in the woods we would be out of the bluster of the wind. Indeed, as soon as we walked into the trees and down to the stream, the woods grew quiet.

Marti led us to some logs where she had found Honey Mushrooms (*Armillaria* sp.) and Velvet Foot (*Flammulina velutipes*) just weeks before. We did find some old Honeys, and we were fortunate to pick some small fresh Velvet Foot (also called the Winter Mushroom because it can be found in the middle of winter during a thaw). Pulling one overlapping cap away from the one beneath, we could see the white spore deposit. The pubescent bases of the stems were obvious. The deadly poisonous look-alike *Galerina marginata* has a brown spore color.

We stumbled upon a dead doe. It looked as if she had been shot from above, probably by a hunter lurking in his treestand.

Back at the house we cooked up the Velvet Foot mushrooms with venison and folded them into wrap sandwiches. Marti had experimented with a cornbread recipe that was deemed a success—especially good with honey from her hives. However, she bemoaned the fact that her bees were infected with mites, *Varroa destructor,* an inadvertent stowaway on bees smuggled into the United States sometime before 1987. The mites, who feed on the blood of immature bees as they develop in their brood cells, can wipe out a honeybee colony.

Treatment for bee mites has ranged from peppermint oil to heated "mite zappers" to chemical pesticides. The chemicals work for a time, but the mites soon develop resistance to them. Steve Sheppard, entomology professor at Washington State University, has investigated control methods that take advantage of the fact that queen bees measure the size of comb cells with their antennae to decide whether to lay a male or female egg. Since the mites preferentially reproduce on male brood, beekeepers can add special combs to each hive that will produce only drone bees. Once these cells are full, the combs are removed and put into a freezer to kill the mites. This method is economical only for small beekeepers, as it is too labor-intensive for commercial operations.

New developments in the control of bee mites utilize the fungi *Metarhizium anisopliae* or *Hirsutella thompsonii*, which are lethal to the bee mites and harmless to the honeybees (although *Metarhizium* does kill termites, locusts, and grasshoppers). These fungi are deuteromycetes like *Aspergillus* and *Penicillium*. They are often called "imperfect fungi" because they have no known sexual stage. They produce spores neither within asci nor upon basidia but reproduce solely through conidia (asexual spores) by budding in one manner or another.

Plastic strips coated with dry fungal spores are placed in the honeybee hives. The bees chew up the strips and spread the spores throughout the colony. The fungal spores attach to and germinate on the surface of the mites. The fungus forms a swelling that produces a peg that penetrates the cuticle of the host; thus the mites are not required to ingest the spores. Growth of the fungus is usually confined to the haemolymph (blood) of the host prior to death. When the host dies, the fungus takes over the cadaver and envelops it with a mat of green conidia. In field trials most of the mites were dead within three to five days.

Perhaps a new strain of honeybee will evolve that carry the spores of the useful fungi with them much as some ants and termites carry their symbiont fungus along to establish it in new colonies. We hope that the honeybees will survive and that we will continue to enjoy Marti's honey next year.

[*A picture of the honeybee mite can be found at www.invasive.org/browse/detail.cfm?imgnum=1321060, and examples of the fungi* Metarhizium *and* Hirsutella *can be found at www.mycolog.com/chapter14.htm*.]

The Mushroom Hunt

In early days, ere Common Sense
And Genius had in anger parted,
They made to friendship some pretense,
Though each, Heaven knows! diversely hearted.
To hunt for mushrooms once they went,
Through nibbled sheepwalks straying onward,
Sense with his dull eyes earthward bent,
While Genius shot his glances sunward!
Away they go! On roll the hours,
And toward the west the day-god edges;
See! Genius holds a wreath of flowers,
Fresh culled from all the neighboring hedges!
Alas! ere eve their bright hues flit,
While Common Sense (whom I so doat on!)
Thanked God "that he had little wit,"
And drank his ketchup with his mutton.

—*Halpin*

Errata

A line of text was left off the NAMA Foray registration form in the last issue. The line should read "Commuters: (all programs, lunches and dinners) $235 US — $270 Can". The registration form in this issue should be accurate. My apologies for any problems this caused.—*Britt*

A Mushroom Is a Microscopic Kind of Thing

The toadstool on the forest floor
Is nourished by a tiny thread;
A microscopic tube,
Digesting as it goes;
Oozing gluey juices,
In wood or straw it grows—

Incessantly the dead it seeks,
Meekly, silent and in secret,
All the while never sleeping;
Even insect bodies reeking
Satisfy its micro-soul;
Its quiet need for breeding
In sweet odiferous decay.

So when we see the mushroom,
The fungus work is mostly done.
For it doesn't hurt a mushroom
To be picked—it may even benefit.

No longer shy,
And wallowing
In its mushy success,
The hidden self emerges;
A fleshy organ rises,
In unabashed reproduction;
The wondrous fruiting body,
Sinister in all its forms,
Gills and teeth and pores
Releasing spores galore,
That return to the safety
Of the unseen world.

—*Dana L. Richter*

[*All rights reserved; used with permission.* *Dana is a research scientist at the School of Forestry, Michigan Tech. University of Michigan, in Houghton. MI, <dlrichte@mtu.edu>.]*

2006 NAMA Photo Contest Entry Form

Name: _____

Address: _____

_____

_____

Phone: _____ E-mail: _____

_____

Classification: Limited [ ] Open [ ]

35mm slide contest: If there are not enough entries for two divisions, all entries will be judged in one division.

Digital: There will only be one division.

Entry Titles

Pictorial (Limited to 6 entries)

P–1: _____ P–4: _____

P–2: _____ P–5: _____

P–3: _____ P–6: _____

Documentary (Limited to 6 entries)

D–1: _____ D–4: _____

D–2: _____ D–5: _____

D–3: _____ D–6: _____

Judges' Option (Limited to 3 entries)

JO–1: _____

JO–2: _____ S–1: _____

JO–3: _____ S–2: _____

S–3: _____

Entry fee enclosed: [ ] $4.00 for 35mm slide contest

[ ] $4.00 for digital contest

- *You must submit two entry forms if you enter both contests. Forms may be photocopied or downloaded from the Internet.*
- *Digital images may be e-mailed to namphocon@yahoo.com or mailed on a CD.*
- *For additional Digital Photo Contest Guidelines and FAQs see http://briefcase.yahoo.com/namphocon.*
- *Mail entry forms, entry fees, slides and/or CD, with check payable to NAMA, to*

John Plischke III—**Slides**
201 Culbertson Avenue
Greensburg, PA 15601
(724) 832-0271
fungi01@aol.com

Damian Pieper—**Digital**
35 Ventura Avenue
Iowa City, Iowa 52245
namphocon@yahoo.com

All entries must be received by June 15, 2006!

Annual Photo Contest Rules

Eligibility: The contest is open to all paid-up NAMA members. Non-members may enter if a separate check for 2006 dues ($35.00) is enclosed with the entry. Slides that have previously won (including Honorable Mention) are not eligible.

Closing Date: All ***entries*** must be received by the Contest Director(s) ***on or before June 15, 2006.*** Allow at least one week for mailing.

Subject material: For Pictorial and Documentary, organisms from the Myxomycota (slime molds) and the classes Basidiomycetes and Ascomycetes of the Eumycota ("true fungi") are eligible. For Judge's Option, nearly anything goes as long as 1) the theme relates to fungi and 2) fungi are a key element of the photograph.

Entry Divisions: For the 35mm slide contest, if there are not enough entries for two divisions, all entries will be judged in one division. There will be only one division in the digital contest.

Pictorial: This division is for single photos that illustrate the beauty and variety of fungi in form and color. The objective is a photo suitable for display or illustration in a fine book. Judging criteria include consideration of both technical (focus, depth of field, exposure, lighting, color, absence of distracting elements) and artistic (composition, color, background, lighting) aspects.

Documentary: For single photographs especially suited as illustrations in a field guide or monograph or for use in a lecture. Emphasis is placed on portrayal of key morphological characteristics such that the usefulness of the image as an identification aid is maximized. Subjects may be shot in the field, laboratory, or studio; and the photographer has complete freedom to process, manipulate, or orient the specimen in any desired manner to achieve the goal. Close-ups of single features and photomicrographs are acceptable. Judging criteria will be the same as in the Pictorial category, but they will be of secondary importance to the overall mycological utility of the photo. Accurate identification of the subject will be a consideration.

Judge's Option: For single photos or series that do not fit into Pictorial or Documentary divisions. Examples include time-lapse series, ecological relationships of fungi (e.g. fairy rings), fungi with animals, people enjoying fungi.

Mushrooms in a Series: For single photos or series which do not fit into the Pictorial or Documentary divisions. Examples include time-lapse series, etc.

Entrant Classifications: Limited or Open classification. *Open* is intended for experienced photographers who are not entering for the first time. *Limited* is intended for the novice. All entries from a person must be in either Limited or Open: no dual classification entrants. Entrants must compete in the Open class if they have won 1st, 2nd, 3rd, or Merit in two or more previous contests. The two classifications are judged separately for the Pictorial and Documentary divisions, and together for the Judge's Option.

Awards: First, 2nd, and 3rd prizes will be awarded in Pictorial and Documentary in both Limited and Open classifications. Additional Honorable Mention awards are given at the judges' discretion up to a maximum of 15% of the entries in that particular category. There will be no ranking in the Judges' Option division, and up to 20% of the entries may be selected. Prizes such as film, subscriptions, book credits, certificates, etc. are awarded, depending on the contest director's resourcefulness and the generosity of donors.

Format: Send color transparencies of any size that will fit into two-inch square plastic or cardboard mounts that function in a standard 80-slide carousel. Glass mounts will not be accepted. Slides may be cropped, retouched, or otherwise reprocessed.

Marking, Listing, and Submitting Slides: Mark each slide with a projection spot at the lower left corner of the mount when viewed right-side up out of the projector. The same side should include the entrant's initials, division initials, and slide number (e.g. OQ K-P-1). Use 1a, 1b, 1c, etc. for sequences. Fill out and submit the Entry Form along with your slides. Send by first class mail. Acknowledgment of receipt will be sent to you. If possible, arrange your packaging so that it can be reused in returning your slides.

Marking, Listing, and Submitting Digital Photos: What information do you want included in the digital photo's file name? If your computer program permits, we'd like to have at least these three things in your filenames: D (for Documentary), JO (for Judges Option), P (for Pictorial), or S (for Mushrooms in a Series); the photographer's initials in 3 spaces, followed by the Genus and species of the fungus or myxomycete if you can identify it; your title for the photo (unless it is the same as the previous) and, of course, the file extension. If you have enough space for your full name, the date the photo was taken, etc., or you wish to include other info, that is a bonus but not required.

Entry Fee: The entry fee for slides is $4.00. The entry fee for the digital contest is $4.00.

Reproduction: Entry in the contest constitutes the consent of the photographer to allow NAMA to reproduce two copies of each winning slide or digital photos (including Honorable Mention) for circulation by the Education Committee among the membership and affiliated societies. NAMA also reserves the right to post images of the winning slides and digital photos on the NAMA website, Namphocon, and in THE MYCOPHILE. All copyrights remain with the photographer.

Questions? Contact the Chair of the NAMA Photo Committee: John Plischke III, 201 Culbertson Ave, Greensburg, PA 15601, (724) 832-0271, e-mail: <fungi01@aol.com>. **See page 17 for Entry Form.**

Marasmius oreades, *the classic fairy ring mushroom or lawn mower mushroom*

Fairy Rings, cont. from page 2

Common edible mushrooms growing on your lawn:

Identifying mushrooms can be tricky. Always rely on a good field guide or join a local club. One of the best field guides for Alberta is *Mushrooms of Western Canada,* since it has so many local species. The field guides will advise you to make a spore print as one of the key identifying features. Take a sample mushroom cap and put it on a piece of paper or glass; cover with a cup or lid. After several hours observe the color of the spore deposit.

Some common lawn mushrooms are described below; some others that cause fairy rings are pictured. *Never eat one that has green spores!*

The "Fairy Ring" mushroom: *Marasmius oreades*

Habitat: Grows on lawns in partial rings.
Cap: Bell-shaped when young, flattening out as it ages, often with a small bump on top. Ivory colored to light brown after it has been rained on.
Stalk: Tough and a bit darker in color than the cap.
Gills: Color similar to the cap. The gills are widely spaced with shorter intermediate gills between. The gills are barely touching the stalk.
Spore color: White or very light cream.

Meadow Mushroom, Champignon, or Portabello: *Agaricus* species

The same genera as the button mushrooms we buy at the store. There are several species of these mushrooms that commonly grow on lawns, and it is difficult to tell one species apart from another.

Habitat: Grows singly or in groups on lawns, sometimes in rings.
Cap: Usually smooth and white to ivory in color, sometimes having some white or dark scales that do not peel off.
Stalk: Short and thick with a veil or ring about halfway up the stalk.
Gills: Color starts out pinkish and turns chocolate brown as the spores mature. The gills are very closely or densely packed. The gills are free from the stalk.
Spore color: Chocolate brown.
Flesh: Color is white but often stains red and then brown when cut open.
Caution: *If the flesh stains bright yellow the mushroom may be poisonous.*

Shaggy Mane: *Coprinus comatus*

Habitat: Grows singly or in bunches on lawns or along roadsides.
Cap: Cylindrical; white in color with brown scales when young.
Stalk: Tall, hollow, and white.
Gills: Color starts out white and turns black as the gills turn to an inky black liquid.
Spore color: Inky black liquid.
Flesh: Fragile and white in color.

[*Martin Osis is the Program Director for the Edmonton Mycological Society, host of NAMA's Annual Foray this summer. Details can be found elsewhere in this issue and at the NAMA website. This article was reprinted from the EMS newsletter, with permission. My apologies to Martin for any slight editing; my spellchecker doesn't agree with his spelling of the word "color"! All photos courtesy of John Plischke, III, except the Amanita on page 2, which is mine. —Britt*]

Chlorophyllum molybdites—*note the green cast to the gills of the mature specimens.*

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THE MYCOPHILE

Mushroom of the Month

What is it? Once you have given up in utter frustration, check "Fungi in the News" to learn the answer.